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USE OF OUTFLOW FOR TREE AND BUSH SPECIES IRRIGATION (ISPOL'ZOVA--ETC(U)
JUN 78 B A ABRAMOV, V I KOROBOV
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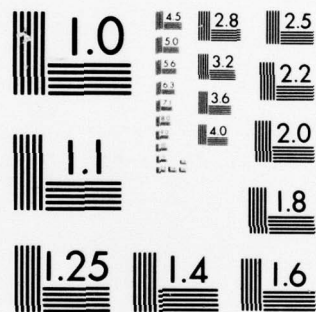
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(Ispol'zovaniye Stokov Dlya Poliva
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USE OF OUTFLOW FOR TREE AND BUSH SPECIES IRRIGATION

ISPOL'ZOVANIYE STOKOV DLYA POLIVA DREVESNO-KUSTARNIKOVYKH POROD in Russian
pp 13-14

[Article by Candidate of Agricultural Sciences B. A. Abramov and Engineer
V. I. Korobov (Volga base of the VNIISV)]

In 1972 studies were initiated in Volgogradskaya Oblast on the use of industrial waste water for the irrigation of tree and bush species. Mixed waste water from the production of Dipterex, caustic soda, and industrial-residential effluents was used. Such waste water is cleaned at the purification systems, diluted (1:2) and channeled into a collector pond ("clean card"). The chemical composition of this water (data provided by the Laboratory of the Volga Base of the VNIISV, mg per liter) is the following: hard residue 1544-2190; HCO_3 - 120-210; Cl -700-1470; SO_4 - 336-442; Ca - 152-212; Mg - 9.6-57.6; Na - 340-609; $\text{P}_{\text{general}}$ - 0.2-18; $\text{Fe}_{\text{general}}$ - 0.5; pH - 7.8-8.7.

The water in the collector pond shows an unstable mineralization in the vicinity of the maximum indicators, even occasionally exceeding them. It has a high sodium content which could be lowered through local plant treatment methods and separation of outflow with a high sodium content.

In the spring of 1972 the following were planted over a 1.5 hectare area: black poplar, small-leaved elm, locust, ash, and tamarisk. All trees were 1 year old and were planted with a tree planting machine (cuttings for poplar and tamarisk and seedlings for the balance). The planting took place under very adverse conditions. The first watering was possible only 1 month later and throughout that time drying winds blew. In order to save the plants all seedlings were trimmed on an inverse growth basis. This reduced the evaporation surface of the plants which survived normally. Four seasonal irrigations were applied on 14 May, 7 June, 7 July and 28 August, on the basis of 1100 cubic meters per hectare, and 1 1,600 cubic meters per hectare water supply watering. Flood watering was used to create an even water stratum. The minimum moisture level was kept at 75-80% of maximum moisture capacity. At the end of the vegetation season the condition of the plants irrigated with purified waste water was the following:

Condition of Tree and Bush Species
(October 1972)

Species	Height, cm	Crown width, cm
Black poplar	57	9
Locust	85	22
Small-leaved elm	47	18
Ash	24	-
Tamarisk	77	25

Toward the end of the season some black poplars became top-dry. The root system was dug out to determine whether or not this was related to the influence of the waste water on the roots. Root depth reached 50 cm with an overall length of 334 cm. No dark spots were found on the root surfaces or cuts. Consequently, the dry top condition of the poplars was the result of the disparity between the water reaching the roots and the high transpiration caused by the excessive dryness of the air. No such dry top condition was noted in the remaining species placed under the same conditions, confirming their great drought hardiness compared with the poplar.

Therefore the 1972 experiments indicated the effectiveness of watering tree and shrub species with purified waste water.